Greater than the sum of their parts

Innovation and performance drive migration to hybrid cloud

In collaboration with:

IBM

Introduction

More than a decade into the cloud era, businesses continue to refine deployment plans to best meet their strategic needs for innovation, agility, resilience, and security. Original research by Oxford Economics and IBM shows an increasing preference for hybrid and/or hybrid multicloud approaches.

Our survey of 6,000 senior executives captures a world in transition. The average percentage of applications in the cloud has grown significantly over the past two years and is expected to continue climbing in the years ahead, with many putting both back-office and customer-facing workloads in hybrid or hybrid multicloud environments.

One growing focus for cloud users is artificial intelligence. Harnessing the power of this suite of emerging technologies is a major imperative for organizations around the world and across industries as they focus on automating processes, modernizing applications, and streamlining development—all factors that will become even more critical as organizations recover from COVID-19 and the associated operational and economic challenges.

About the survey

Total sample: 6,000 CIOs, CTOs, VPs of IT, and equivalent titles from organizations using cloud and AI in some

Sectors covered: Retail, manufacturing, financial services, telecommunications, and healthcare providers and payers

Countries covered: Argentina, Australia, Brazil, Canada, Chile, China, Colombia, Costa Rica, France, Germany, India, Italy, Japan, Mexico, New Zealand, Panama, Peru, Puerto Rico, Saudi Arabia, Singapore, South Africa, South Korea, Spain, United Arab Emirates, United Kingdom, and United States

Dates fielded: May through August 2020

Lessons from early adopters of these two technologies provide useful perspective into the path ahead for all companies. Our analysis of the survey data included identification of two outperformer groups that are further ahead in their adoption of cloud (we call them **Cloud Strategists**; 26.5% of respondents qualify) or both cloud and AI (we call them **Cloud and AI Unifiers**; 13.5% qualify). Respondents from both leader groups are more likely than others to report effective technology operations; when it comes to their combined cloud and AI projects, **Cloud Strategists** are more likely to report positive technical ROI in areas such as process automation and business operations, while **Cloud and AI Unifiers** are more likely to report positive business ROI in areas such as business and financial operations.

AI demands flexibility, agility, and an integrated data platform. More companies—especially those furthest along in adopting cloud and AI—are turning to hybrid cloud and hybrid multicloud environments to support those aims.

Defining hybrid cloud

We asked survey respondents to differentiate between multiple types of hybrid cloud environments:

- **Hybrid** refers to a technology environment that mixes public cloud, private cloud, and on-premises.
- **Hybrid multicloud** is a combination of running applications on all types of environments, including multiple public clouds and at least one private cloud.

The big shift to cloud

Cloud is already making a measurable impact on business and is important to a range of strategic areas, from determining which AI projects to pursue to facilitating data-sharing, analytics, and machine learning.

A difficult year has brought the technology to the forefront: 59% say investing in cloud has become more important as a result of COVID-19. One large financial services institution has been motivated to move more to cloud as a result of operational difficulties during pandemic-related shutdowns, when accessing its own data centers became increasingly difficult and unpredictable. The company plans to keep some of its core processing in house, but, according to the CTO, "everything else—trading platforms, analytics platforms, fund platforms—can be in the cloud and should be in the cloud."

This trend is reflected in our survey data. Respondents expect well over half (56%) of applications, on average, to be in the cloud by 2022, up from 39% today and 22% two years ago. Very few expect critical workloads like customer-facing applications or back-office operations to remain out of the cloud over the next two years.

Despite this healthy pace of adoption, IT executives face a range of challenges along the way. A small subset (roughly 5%) of respondents are dissatisfied with their cloud hosting environment in some way, whether because of poor customer support, security concerns, or lack of interoperability.
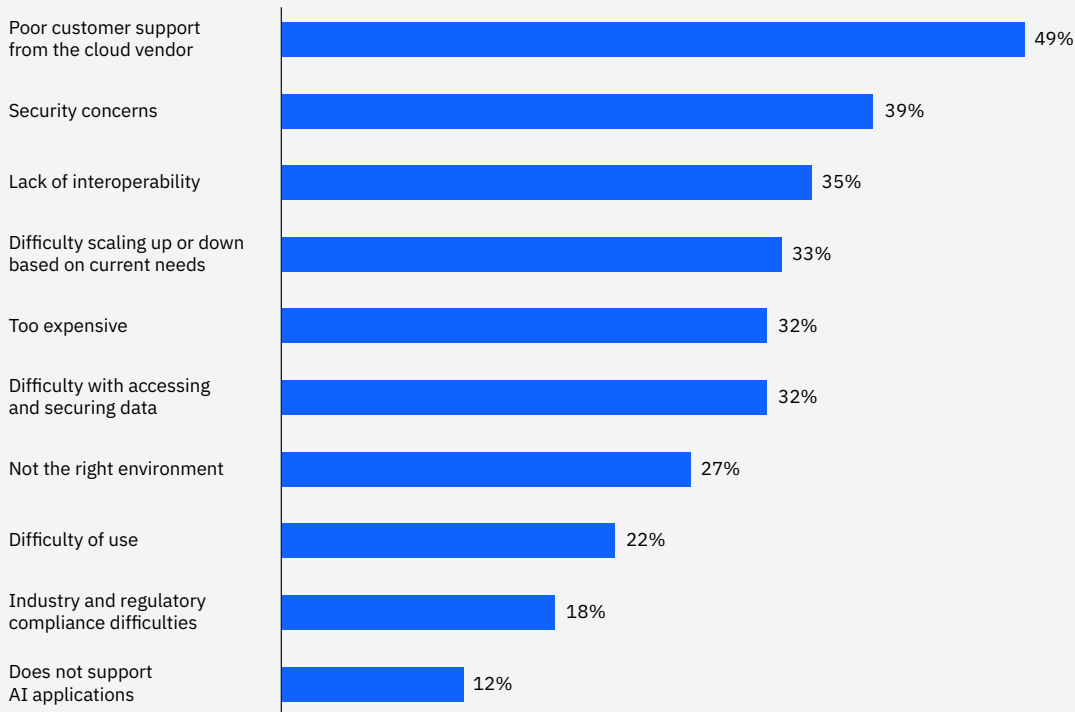
About two-thirds of those respondents dissatisfied with their cloud environment plan to do something about it; most say they will change processes to better fit the investment, rather than change or cancel their investment. "You're always going to run into challenges where people have been doing something in a certain way, and they're just not open to change," says Gus Shahin, CIO of Flex Ltd., a Singapore-based manufacturer with more than $25 billion in revenue. "In a lot of cases, you can work through it, and other cases, you just have to make tough decisions."

Fig. 1: What hinders cloud environment satisfaction?

Q: You noted that you are dissatisfied with your cloud environment in some capacity. Which of the following reasons best explain your dissatisfaction?

Base = 305

Reason	Percentage
Poor customer support from the cloud vendor	49%
Security concerns	39%
Lack of interoperability	35%
Difficulty scaling up or down based on current needs	33%
Too expensive	32%
Difficulty with accessing and securing data	32%
Not the right environment	27%
Difficulty of use	22%
Industry and regulatory compliance difficulties	18%
Does not support AI applications	12%

The growth of hybrid strategies

Cloud strategy increasingly depends on finding the right mix of environments for different purposes, rather than choosing between public and private clouds. Our research shows that, as companies focus on cloud as a foundational piece of their technology infrastructure, a majority are moving toward hybrid and/or hybrid multicloud environments.
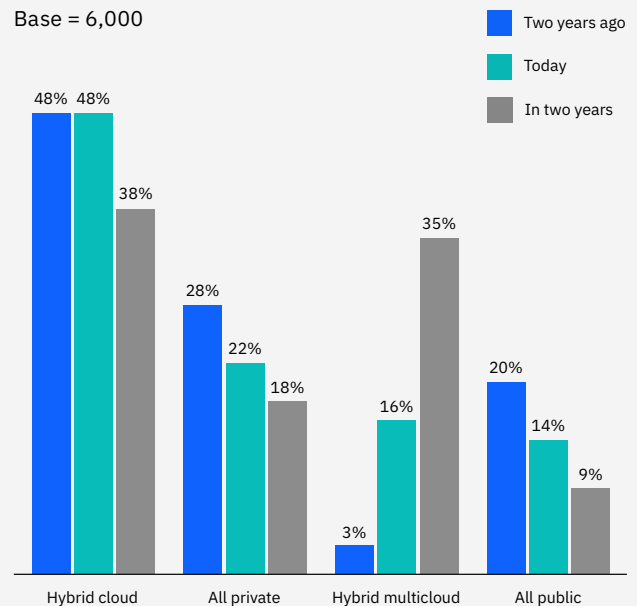
"We are trying to move to a model that is cloud-agnostic," the financial services CTO says, noting that the hybrid approach allows them to meet risk and resiliency requirements, a factor the executive says is increasingly important for the largest firms in the sector.

This migration to hybrid cloud environments has already begun. Hybrid cloud is the most popular among our survey respondents, with many expecting to shift to a hybrid multicloud environment in two years.

Fig. 2: Hybrid is the dominant cloud environment

Q: Which best describes your approach to cloud usage, two years ago, today, and in two years?

Base = 6,000

Legend: Two years ago / Today / In two years

	Two years ago	Today	In two years
Hybrid cloud	48%	48%	38%
All private	28%	22%	18%
Hybrid multicloud	3%	16%	35%
All public	20%	14%	9%

This move to hybrid cloud is happening across many different types of workloads. Hybrid cloud is the most common environment for most functions we asked about; in two years, more expect to shift to the hybrid multicloud variety. At the same time, many still want to use private cloud for certain types of information (for example, intellectual property and finance).

Hybrid multicloud users tend to be more satisfied with that environment than users of other cloud types (48% are highly satisfied with their hybrid multicloud environment, vs. 21% with hybrid cloud, 22% private cloud, and 8% public cloud).
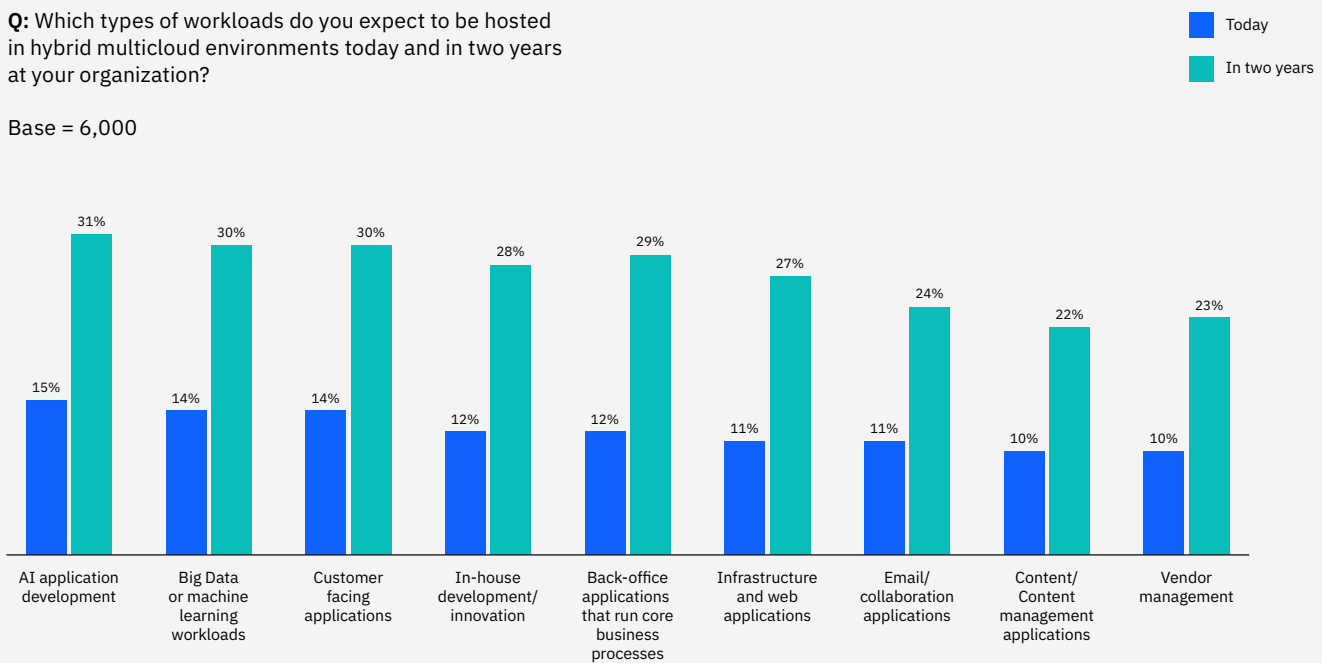
Decisions about where to host cloud applications often hinge on possible ROI (the top-cited response, followed by complexity of the business application and scalability). Hybrid and hybrid multicloud users are less likely to cite ROI as a key motivator (38% say so, vs. 42% of private cloud users and 47% of public cloud users)—though it is still the top factor influencing their decisions.

In general, hybrid users are influenced by a broad range of factors, including access to AI services and models (25%, vs. 23% of private users and 17% of public users) and access to IoT (24%, vs. 22% and 12%). Still, they are less likely to emphasize certain requirements such as the need for scalability (32%, vs. 35% of private users and 36% of public users); the criticality of the business application (23%, vs. 29% and 29%); and opportunities to create new business models (23%, vs. 30% and 28%).

Fig. 3: The migration to hybrid models

Q: Which types of workloads do you expect to be hosted in hybrid multicloud environments today and in two years at your organization?

Base = 6,000

Today
In two years

|	Today	In two years
AI application development	15%	31%
Big Data or machine learning workloads	14%	30%
Customer facing applications	14%	30%
In-house development/ innovation	12%	28%
Back-office applications that run core business processes	12%	29%
Infrastructure and web applications	11%	27%
Email/ collaboration applications	11%	24%
Content/ Content management applications	10%	22%
Vendor management	10%	23%

How hybrid cloud supports AI

Cloud strategies increasingly support advanced applications of other technologies, such as the Internet of Things, automation, and artificial intelligence. Survey respondents across environments see their cloud and AI strategies as closely intertwined, but our findings suggest that hybrid environments may be the most AI-friendly.

The Chief Medical Information Officer of a large health system in the southeastern United States expects major transformation of patient care due to cloud-based artificial intelligence applications. These include natural language processing, to take notes and process orders during provider-patient meetings; automated MRI readings, to support diagnoses; and pre-screenings for dermatology patients. So far, the system's adoption of such next-generation services has largely been driven by technology vendor capabilities, while innovation among its partners has pushed the system to move forward in other areas as well.

Fig. 4: Hybrid multicloud on the rise

Q: What percentage of your artificial intelligence applications were enabled by hybrid multicloud two years ago?
What percentage are enabled by hybrid multicloud today?
What percentage do you expect to be enabled by hybrid multicloud in two years? Mean responses shown.

13.3%
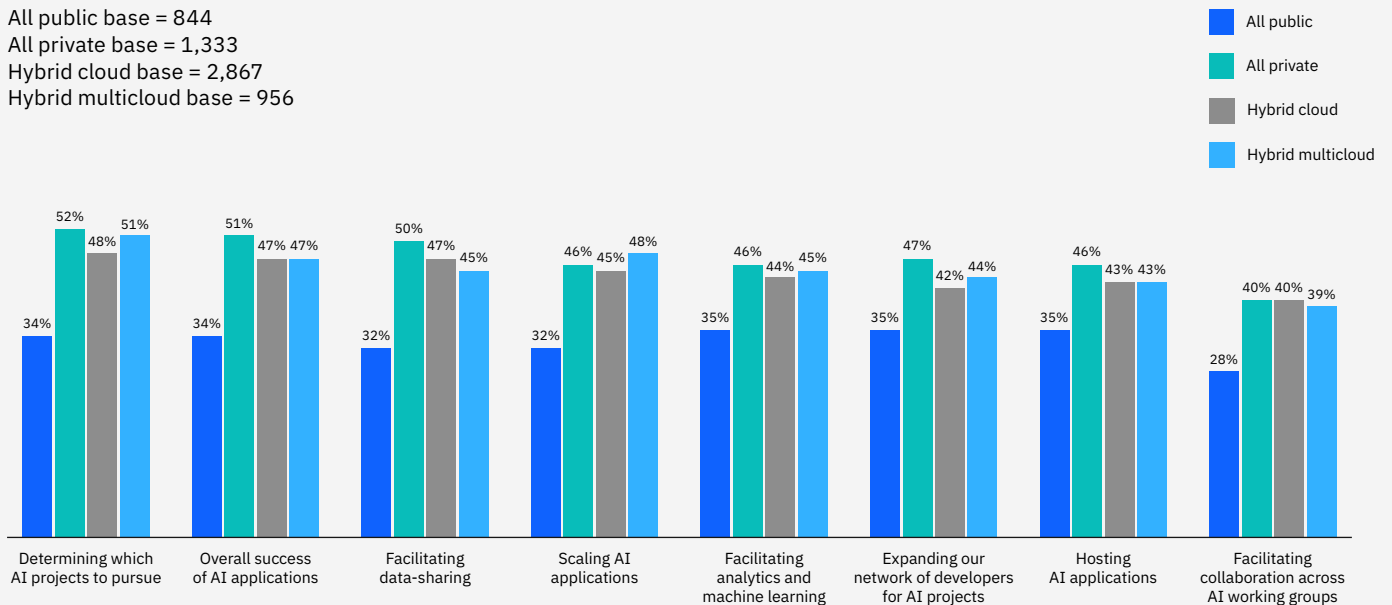Two years ago

27.5%
Today

40.7%
In two years
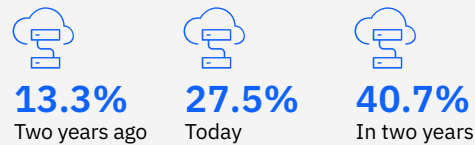
Many respondents—not just hybrid cloud users—see their use of cloud as substantially important to the overall success of AI applications (47%), determining which AI projects to pursue (47%), scaling AI applications (44%), expanding their network of developers for AI projects (42%), hosting AI applications (42%), and facilitating collaboration across AI working groups (38%). As Fig. 5 shows, hybrid cloud and private cloud users are much more likely to say their use of the technology is critical in these areas than are public cloud users.

Fig. 5: How cloud supports AI development

Q: How important is your use of cloud to current initiatives in your organization? "Critical" and "Substantially important" responses

All public base = 844
All private base = 1,333
Hybrid cloud base = 2,867
Hybrid multicloud base = 956

Legend:
- All public
- All private
- Hybrid cloud
- Hybrid multicloud

Category	All public	All private	Hybrid cloud	Hybrid multicloud
Determining which AI projects to pursue	34%	52%	48%	51%
Overall success of AI applications	34%	51%	47%	47%
Facilitating data-sharing	32%	50%	47%	45%
Scaling AI applications	32%	46%	45%	48%
Facilitating analytics and machine learning	35%	46%	44%	45%
Expanding our network of developers for AI projects	35%	47%	42%	44%
Hosting AI applications	35%	46%	43%	43%
Facilitating collaboration across AI working groups	28%	40%	40%	39%

The hybrid cloud payoff

Expectations are high for AI investments. Modernizing business processes, automating decision-making and workflows, improving customer experiences, and supporting agility are among the top motivators for all types of users—although hybrid cloud users are somewhat more focused on using AI for IoT applications (17%, vs. 12% of private cloud users and 9% of public cloud users) and determining which applications and processes to move to the cloud (13%, vs. 9% of private cloud users and 10% of public cloud users).

Some cloud users are quicker to see payoffs. Our analysis of the survey data identified two outperformer groups of respondents—we call them **Cloud Strategists** and **Cloud and AI Unifiers**—that are ahead in adopting cloud and AI.

Cloud and AI Unifiers are more likely than all others to say their combined cloud and AI projects have delivered the most ROI in terms of business operations, financial operations, human resources, and risk and compliance; they also are more likely to say their organization's use of cloud has enabled or accelerated value realized in a range of areas, including customer experience and the development of AI applications. Meanwhile, **Cloud Strategists** report higher rates of technical ROI in process automation, customer service, and business operations. But early leaders still have work to do, as even **Cloud Strategists** and **Cloud and AI Unifiers** are unlikely to report substantial ROI in some important areas.

Our analysis of the survey data included identification of two outperformer groups that are further ahead in their adoption of cloud and AI.

- To qualify for the **Cloud Strategists** group, respondents must report a higher-than-average percent of applications in the cloud two years ago, today, and expected in two years; 26.5% of respondents qualify.
- To qualify for the **Cloud and AI Unifiers** group, respondents must meet the above criteria; report that more than one-fifth of new applications incorporate AI; use cloud in combination with AI; and agree that a unified platform for cloud, AI, and data is critical to success. 13.5% of respondents qualify.
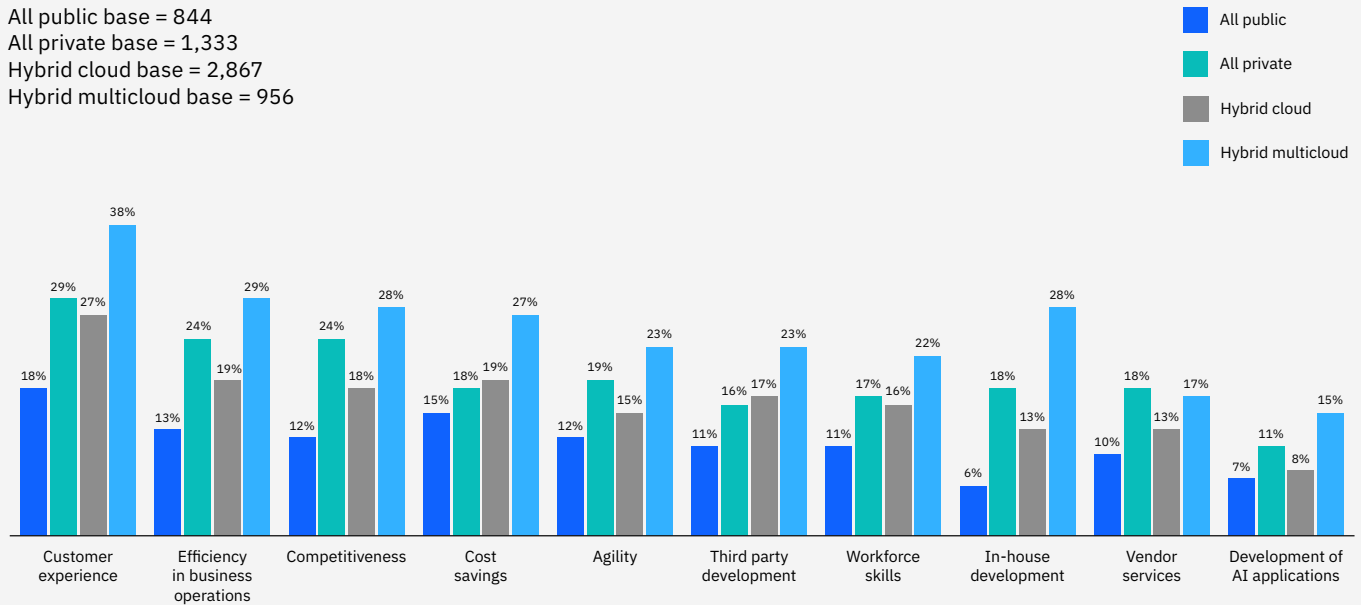
Respondents from both groups are more likely to report effective technology operations in areas from security and infrastructure to data and applications; they also are somewhat more likely to be hybrid and/or hybrid multicloud users.

Some determinants of success may tie to organizational strengths that go beyond IT. When we asked about organization responses to COVID-19, **Cloud and AI Unifiers** were more likely to report an increase in focus on team-building and problem-solving and deepening partnerships.

Fig. 6: How cloud accelerates ROI

Q: To what extent has your organization's use of cloud enabled or accelerated your positive return on investment (ROI) in the following areas? "To a significant extent" and "Meaningfully" responses

All public base = 844
All private base = 1,333
Hybrid cloud base = 2,867
Hybrid multicloud base = 956

Legend:
- All public
- All private
- Hybrid cloud
- Hybrid multicloud

Category	All public	All private	Hybrid cloud	Hybrid multicloud
Customer experience	18%	29%	27%	38%
Efficiency in business operations	13%	24%	19%	29%
Competitiveness	12%	24%	18%	28%
Cost savings	15%	18%	19%	27%
Agility	12%	19%	15%	23%
Third party development	11%	16%	17%	23%
Workforce skills	11%	17%	16%	22%
In-house development	6%	18%	13%	28%
Vendor services	10%	18%	13%	17%
Development of AI applications	7%	11%	8%	15%

Conclusion

A growing number of applications are moving to cloud, and IT leaders are choosing hybrid and hybrid multicloud as their preferred environments. Hybrid environments accelerate ROI across companies, compared to all-public and all-private cloud options. And hybrid is seen as the most supportive environment for launching and scaling AI initiatives, particularly with AI app development and big data or machine learning workloads. For more information about how companies across sectors are adopting hybrid cloud and AI, and best practices for implementing the technologies, see the full research report.